

NORTHWESTERN WISCONSIN ELECTRIC COMPANY
PREVENTATIVE MAINTENANCE PLAN
(WI. ADM. CODE 113.0607)

(4280)

In 1984 Northwestern Wisconsin Electric Company (NWE) started a yearly inspection program to visually inspect all distribution and transmission lines within the system on a yearly basis. The plan also includes twice a year inspections of substations.

Inspections are done by line crews, including groundmen.

Guidelines are provided with yearly inspection forms.

CORRECTIVE ACTION SCHEDULE

Crews are instructed to correct all minor violations that can be done safely at the time of inspection. Most of this work is installing warning signs, guy guards, pole wraps, etc.

Crews report any code violations or unsafe conditions immediately to their supervisor and these are corrected immediately.

Replacing older poles and brushing that does not need immediate attention is done as time permits.

Snowmobile trails that follow our Utility Right-of-Ways are patrolled each year and reflective guy guards are installed.

Inspection Reports have been retained since we started out Preventive Maintenance Program in 1984.

Repair records in the past have been small blanket work orders with a small amount of repair recorded with the inspections. We are in the process of changing our system a little so that a review of inspection records will show the date of the repair.

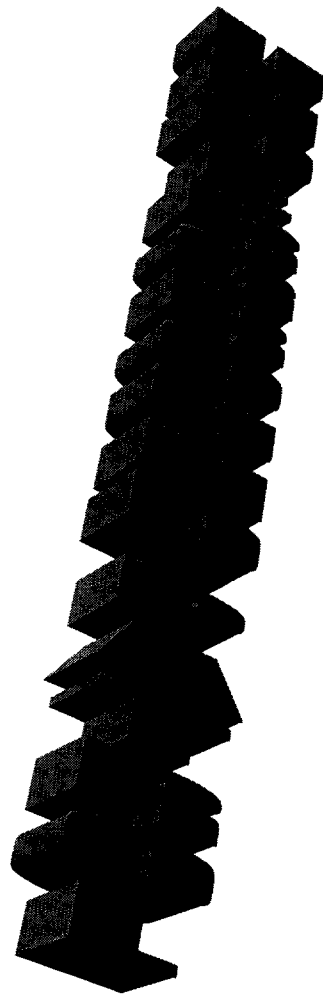
PLAN COST = Approximately \$50,000 per yr. + materials

ITEMS TO WATCH FOR AND/OR CORRECT ON LINE PATROL

UD CHECK

1. Terminations on overhead and take-off poles
2. U-Guard installations
3. Primary and secondary connections on pad mount transformers
4. Check all grounding on UD transformers
5. Check for corrosion
6. Check for damaged installations:
 - a. Transformer
 - b. Junction pedestals
 1. primary
 2. secondary
7. Rodent damage
8. Discoloration from arcing – lightning, etc.
9. Check for proper High Voltage Signing on all URD enclosures
10. Be sure al URD enclosures are properly locked
11. Replace any missing penta head bolts
12. Remove lifting bolts from padmount transformers
13. Check for leaks on transformers

THE LINE PATROL



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VISUAL SUBSTATION CHECK

SUBSTATION _____ DATE _____ TIME TAKEN _____
Spare transformers in SUB - KVA _____ KVA _____ KVA _____

- | | | | |
|---|-------------------------|-----------|--------------------|
| 1. Are oil levels OK | | YES _____ | NO _____ |
| 2. Are oil gauges OK | | YES _____ | NO _____ |
| 3. Are tanks free from leaks | | YES _____ | NO _____ |
| 4. Temperature on transformer | A _____ B _____ C _____ | | |
| 5. Pressure vacuum reading | | | |
| 6. Are all thermometers OK | | YES _____ | NO _____ |
| 7. Are all bushings OK on regulators & transformers | | | YES _____ NO _____ |
| 8. Are all equipment grounds OK | | YES _____ | NO _____ |
| 9. Is yard clean | | YES _____ | NO _____ |
| 10. Do H.V. Fuses appear OK | | YES _____ | NO _____ |
| 11. How many extra H.V. Fuses in station _____ | | YES _____ | NO _____ |
| 12. Are fuses properly stored | | YES _____ | NO _____ |
| 13. Do all connections appear OK | | YES _____ | NO _____ |
| 14. Do arresters appear OK | | YES _____ | NO _____ |
| 15. Do all switches and disconnects appear OK | | YES _____ | NO _____ |
| 16. Do all insulators in substation appear OK | | YES _____ | NO _____ |
| 17. Do all pot heads appear OK | | YES _____ | NO _____ |
| 18. Is substation fence OK | | YES _____ | NO _____ |
| 19. Fences and gates grounded properly | | YES _____ | NO _____ |
| 20. Erosion or soil build-up | | YES _____ | NO _____ |
| 21. Are all fence heights proper | | YES _____ | NO _____ |
| 22. Are there any missing or faded signs | | YES _____ | NO _____ |
| 23. Check for loose gates & missing fence/Gate grds. OK | | YES _____ | NO _____ |
| 24. Check for missing barb wire and locks - OK | | YES _____ | NO _____ |
| 25. Any evidence of unauthorized entries | | YES _____ | NO _____ |

ITEMS TO WATCH FOR AND CORRECT ON LINE PATROL

- | | |
|-----------------------------------|---|
| 1. SLACK GUY WIRES | 16. GROUND WIRES TOO CLOSE TO POLE TOP PIN |
| 2. SLACK PRIMARY | 17. BROKEN INSULATORS AND BELLS |
| 3. SLACK SECONDARY | 18. HOT CLAMPS NOT ON ARMOR ROD |
| 4. ANCHORS PULLING | 19. INADEQUATE CLEARANCE OVER ROADS, DRIVEWAYS
TELEPHONE LINES, ETC. |
| 5. DISCONNECTED GROUNDS | 20. BRANCHES THAT NEED TRIMMING |
| 6. RADIO NOISE | 21. DEAD TREES WITHIN FALLING DISTANCE OF LINES |
| 7. BAD POLES | 22. UNDERBRUSH NEEDING CUTTING |
| 8. POLES NOT PLUMB OR IN LINE | 23. GUY WIRES AND ANCHORS NOT NEEDED |
| 9. POLES BEING WASHED OUT | 24. GUY WIRES AND ANCHORS TO BE ADDED |
| 10. DAMAGED CROSS ARMS | 25. PROPER CONNECTIONS ON TRANSFORMERS |
| 11. BAD TIE WIRE | 26. DAMAGED CROSS ARM BRACES |
| 12. DAMAGED CONDUCTORS | 27. ALL POLES INSTALLED AFTER JANUARY 1, 1995 MUST
HAVE WARNING SIGNS |
| 13. TREES TO BE CUT | 28. NOTE LOCATION OF EPOXILATORS |
| 14. LOOSE OR DAMAGED HARDWARE | 29. NOTE LOCATION OF TWIST SLEEVES |
| 15. GROUNDS THAT NEED RE-STAPLING | 30. NOTE LOCATION OF ANY DOORS LEFT HANGING IN
CUTOUTS THAT SHOULD BE HUNG ON THE POLE |

[illegible]

JANUARY 2001

ANNUAL LINE INSPECTION ASSIGNMENT

MILLTOWN

Balsam Lake Village
Balsam Lake Township
St. Croix Township
E. Eureka, Section 6,7
18,19,30,31

Color Code: Yellow
Approx. Miles: 46

Milltown Village
Milltown Township
E. Eureka, Sections
2,3,4,11,12,13,14,15,24,
25,26,27,32,33,34,35,36
Luck Township, Sections
31,32
Color Code: Blue
Approx. Miles: 56

FREDERIC

Frederic Village
West Sweden Township
Luck, Sections 4,5,6,
Trade Lake Township excluding
S ½ of Section 5, all of Section 6
Daniel Township, Section 21.
27,28,29,30,33,34

Color Code: Green
Approx. Miles: 54

Laketown Township
Sterling Township
Anderson Township
Sections 13,23,24,25,26,35,36

Color Code: Orange
Approx. Miles: 61

Clam Falls Township
Lorain Township
West Sweden Township
Sections 12,22,23,24
Color Code: Pale Red
Approx. Miles: 34

GRANTSBURG

Grantsburg Village
Grantsburg Township
Anderson Township
Sections 1,2,11,12
Trade Lake Township
N ½ Section 5, all of Section 6

Color Code: Purple
Approx. Miles: 17

Wood River Township

Color Code: Brown
Approx. Miles: 44

W. Marshland Township
Lincoln
Daniels, Sections 4,5,6,
7,8,9,16,17,18,19,30

Color Code: Red
Approx. Miles: 25

January 2001

ANNUAL INSPECTION ASSIGNMENT, CONT.

SIREN

Siren Village

Siren Township
Daniels, Sections 1,2,3
10,11,12,13,14,15

Meenon Township
Oakland Township
Sections 27,32,33

Color Code: Light Blue
Approx. Miles: 27

Webb Lake Township
E Swiss Township
Jackson Township
Scott Township

Color Code: Grey
Approx. Miles: 64

Oakland Township,
excluding
Sections 27,23,33
Union Township
W Swiss Township

W. Blaine Township
Arna, MN Township
Sections 25,26,30,36

Color Code: Pine
Approx. Miles: 59

TRANSMISSION LINE TO BE
PATROLLED BY:

Burnett County
Pole County
Rock Creek

SUBSTATIONS BY:
Twice Yearly

Burnett County
Polk County

Dan C. Patrol Snowmobile Trails in
Pine, Polk and Burnett Counties

baj-annual line insp

Report No. _____

Northwestern Wisconsin Electric Co.

Line Patrol Report

Location		Trees Needing Attention				Brush under line				Attention Needed In			Recom. Correction			Structural or Conductor Defects Including Secondary							Substation		Date		
From	To	Trim	Top	Remove	Light	Medium	Heavy	Scattered	Immediate	1 Year	2 Year	Hand cut	Trim	Brush pull	Poles	Conductor	X-Arm	Insulator	Hardware	Guys	Grounds	Sag	Erosion	Other	Circuit	Remarks	